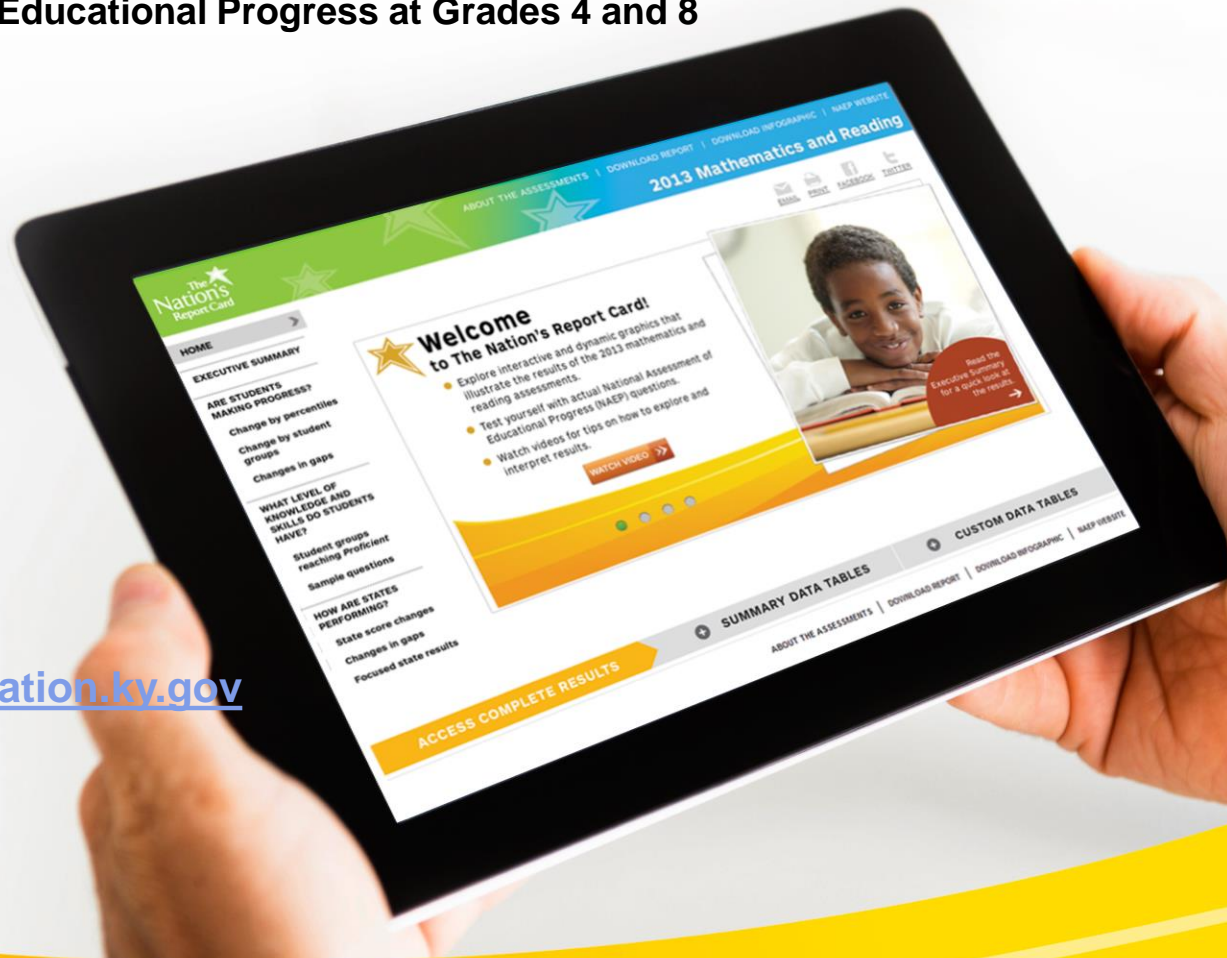


# 2015 NAEP Mathematics

National Assessment of Educational Progress at Grades 4 and 8

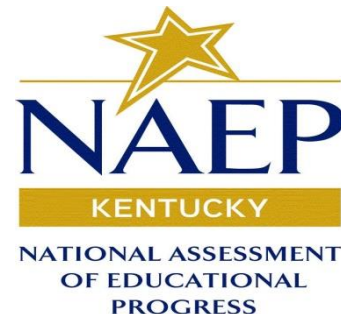


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**2015 KY Mathematics**

# NAEP 2015

## Mathematics

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Kentucky NAEP State Coordinator  
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# What is NAEP?



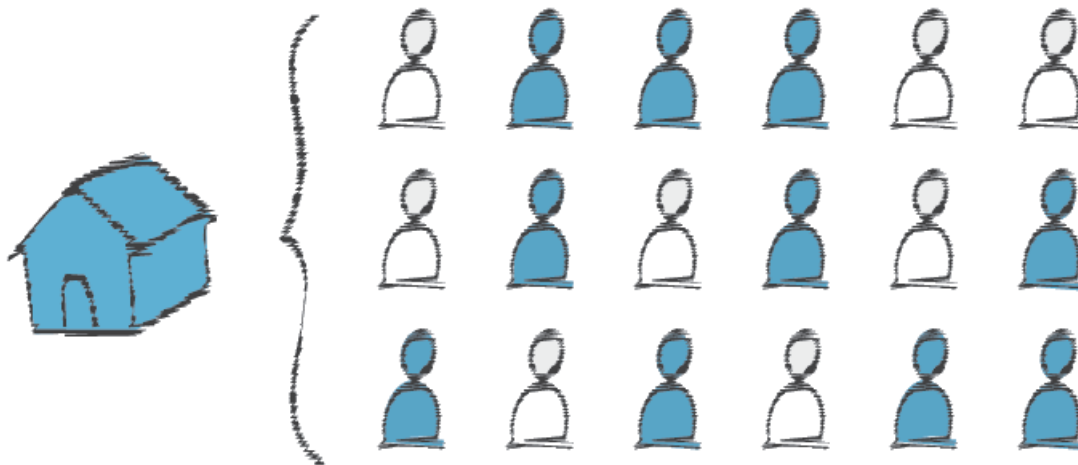
- The National Assessment of Educational Progress (NAEP) is the largest continuing and nationally representative assessment of what our nation's students know and can do in core subjects.
- A survey designed to produce national, state, and select urban district level results.
  - NAEP results are for populations of students, not for individual students nor schools.
  - Measures student performance nationally and reports changes over time.
  - Allows comparisons between states and the nation.

# NAEP School and Student Selection

- NAEP uses a carefully designed sampling procedure for the assessment to be representative of the geographical, racial, ethnic, and socio-economic diversity of schools and students in the state.
  - First, a sample of schools is selected.
  - Then, within each chosen school students are randomly selected to participate. Each participating student represents hundreds of other similar students.

# NAEP Sample Sizes

- The results from the 2015 mathematics assessment are based on representative samples.
  - 139,900 fourth-grade students from 7,810 schools
  - 136,900 eighth-grade students from 6,150 schools



# NAEP School and Student Selection

- NAEP uses a carefully designed sampling procedure for the assessment to be representative of the geographical, racial, ethnic, and socio-economic diversity of schools and students in the state.
  - First, schools are selected to be representative of schools.
  - Then, within each chosen school students are randomly selected to participate. Each participating student represents hundreds of other similar students.

# 2015 NAEP Administration



- NAEP is administered over a six-week period.
  - For 2015: January 26th – March 6th
  - Each student is only assessed in one subject area.
  - Students only take a small portion of the assessment.
  - Accommodations are provided as necessary for students with disabilities and English language learners.

# NAEP Results



- The results of NAEP are released as *The Nation's Report Card*.
  - The report card provides national, state, and district-level results, results for different demographic groups, inclusion information, and sample questions.
- NAEP Results are reported in two formats
  - Average Scale Scores
    - Numeric scale
    - 0 – 500 on mathematics and reading assessments
    - Scores cannot be compared across content areas
  - Achievement Levels
    - Categorical scale
    - Below *Basic*, *Basic*, *Proficient*, *Advanced*



# Student, School/District Characteristics for Kentucky Public Schools



Student Characteristics	Racial/Ethnic Background	School/District Characteristics
Number enrolled: <b>681,987</b>	White: <b>81.1%</b>	Number of school districts: <b>174*</b>
Percent in Title I schools: <b>84.8%</b>	Black: <b>10.7%</b>	Number of schools: <b>1,571</b>
With Individualized Education Programs (IEP): <b>14.4%</b>	Hispanic: <b>4.3%</b>	Number of charter schools: <b>N/A</b>
Percent in limited-English proficiency programs: <b>2.4%</b>	Asian/Pacific Islander: <b>0.0%</b>	Per-pupil expenditures: <b>\$9,133</b>
Percent eligible for free/reduced lunch: <b>54.0%</b>	American Indian/Alaskan Native: <b>0.1%</b>	Pupil/teacher ratio: <b>16.2</b>
		Number of FTE teachers: <b>41,860</b>

# 2015 NAEP Participation School and Student Counts

## Total number of schools that participated:

- Grade 4 - 153
  - Grade 8 - 117
  - Grade 12 - 20 – (For National Only)
- 290 (Includes JCPS TUDA Schools)

## Total number of students assessed:

- Grade 4 – 3,000
  - Grade 8 – 3,100
- 6,100

# 2015 Kentucky Participation in NAEP



- Total Kentucky NAEP Districts – **107**
  - 4<sup>th</sup> Grade – **153 (State NAEP)**
  - 8<sup>th</sup> Grade – **117 (State NAEP)**
  - 12<sup>th</sup> Grade – 20 (National only)
- 290 Total Schools**

- 
- *TUDA (Jefferson County) -100 Schools*



# Mathematics

NATIONAL ASSESSMENT OF EDUCATIONAL PROGRESS AT GRADES 4 AND 8

# MATHEMATICS

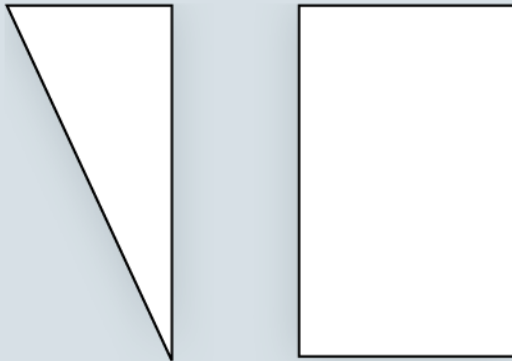


## Proportions of questions vary by grade in five mathematical content areas

	Grade 4	Grade 8
Number properties and operations	40%	20%
Measurement	20%	15%
Geometry	15%	20%
Data analysis, statistics, and probability	10%	15%
Algebra	15%	30%

## Geometry Question

Nationwide 49% of fourth-graders were able to identify a property common to two geometric shapes



How are the right triangle and the rectangle alike?

- Ⓐ Each figure has at least one right angle.
- Ⓑ Each figure has parallel sides.
- Ⓒ Each figure has at least one line of symmetry.
- Ⓓ Each figure has at least two sides that are the same length.

Percentage of fourth-grade students in each response category: 2011

Choice A	Choice B	Choice C	Choice D	Omitted
49	9	12	29	1

Eligibility  
for free/  
reduced-price  
school lunch

Yes	41
No	58

## Algebra Question

31% of eighth-graders were able to identify the equation given a point and the slope

Which of the following is an equation of a line that passes through the point (0, 5) and has a negative slope?

- (A)  $y = 5x$
- (B)  $y = 5x - 5$
- (C)  $y = 5x + 5$
- (D)  $y = -5x - 5$
- (E)  $y = -5x + 5$

Percentage of eighth-grade students in each response category: 2011

Choice A	Choice B	Choice C	Choice D	Choice E	Omitted
12	27	9	20	31	1


Selected racial/ethnic groups	
White	34
Black	24
Hispanic	25
Asian	52
American Indian/ Alaska Native	20
Native Hawaiian/ Other Pacific Islander	22



# 2015 Math: Achievement Levels

## Achievement Level Policy Definitions

<b>Basic</b>	<b>Partial mastery</b> of prerequisite knowledge and skills that are fundamental for proficient work at each grade.
<b>Proficient</b>	<b>Solid academic performance</b> for each grade assessed. Students reaching this level have demonstrated competency over challenging subject matter, including subject-matter knowledge, application of such knowledge to real-world situations, and analytical skills appropriate to the subject matter.
<b>Advanced</b>	<b>Superior performance.</b>

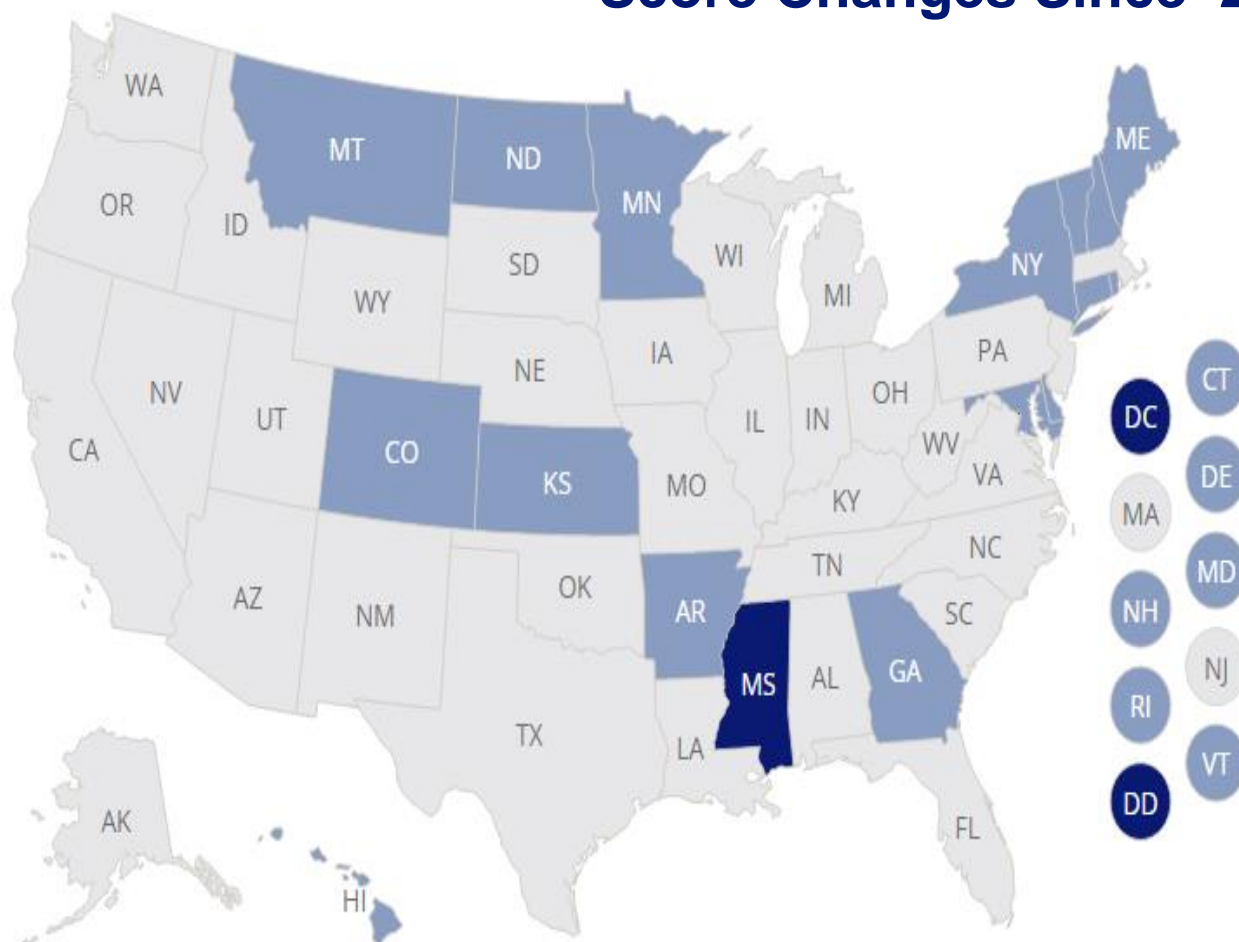


# Grade 4 Mathematics Results



# Grade 4 Mathematics

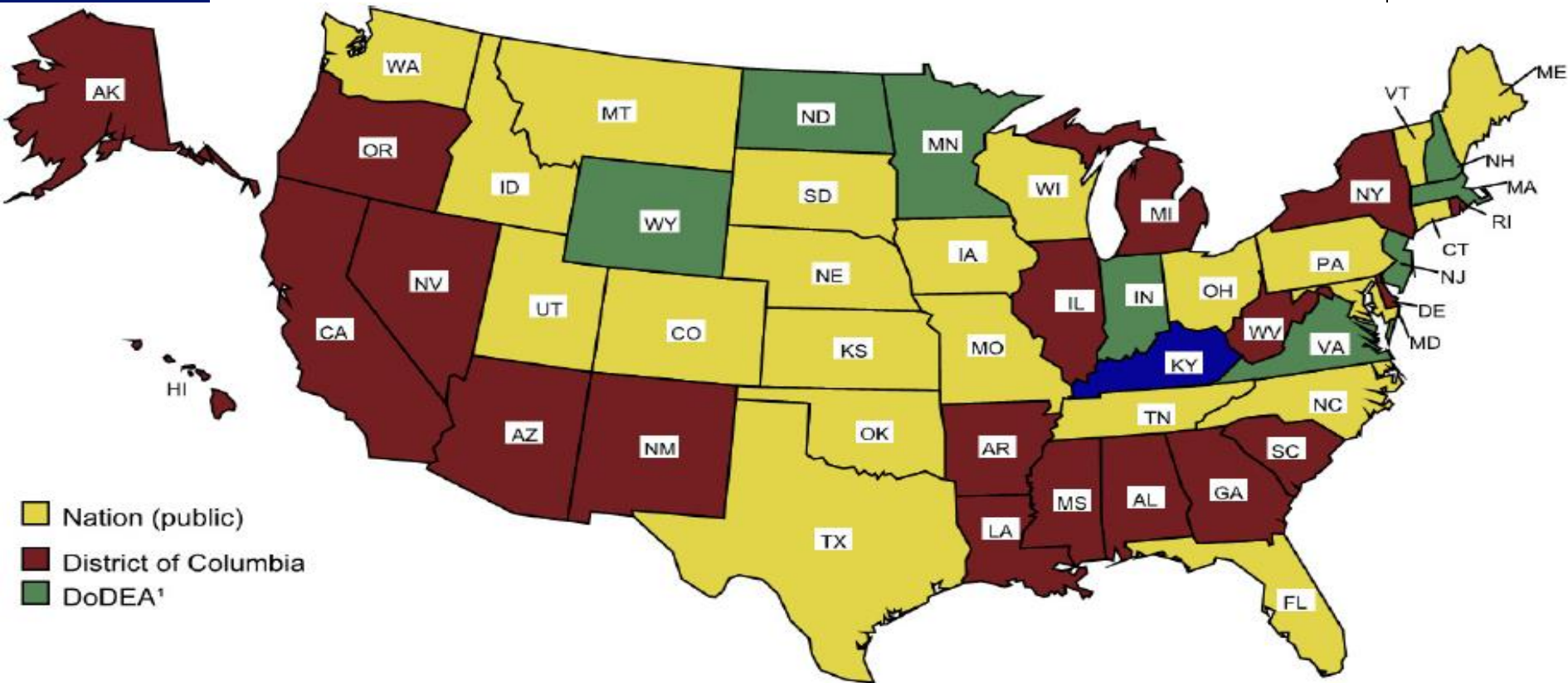
## Score Changes Since 2013



NOTE: DD = Department of Defense Education Activity (DoDEA).



# Grade 4 Mathematics



Focal state/jurisdiction (Kentucky)



Higher average scale score than Kentucky (9 jurisdictions)



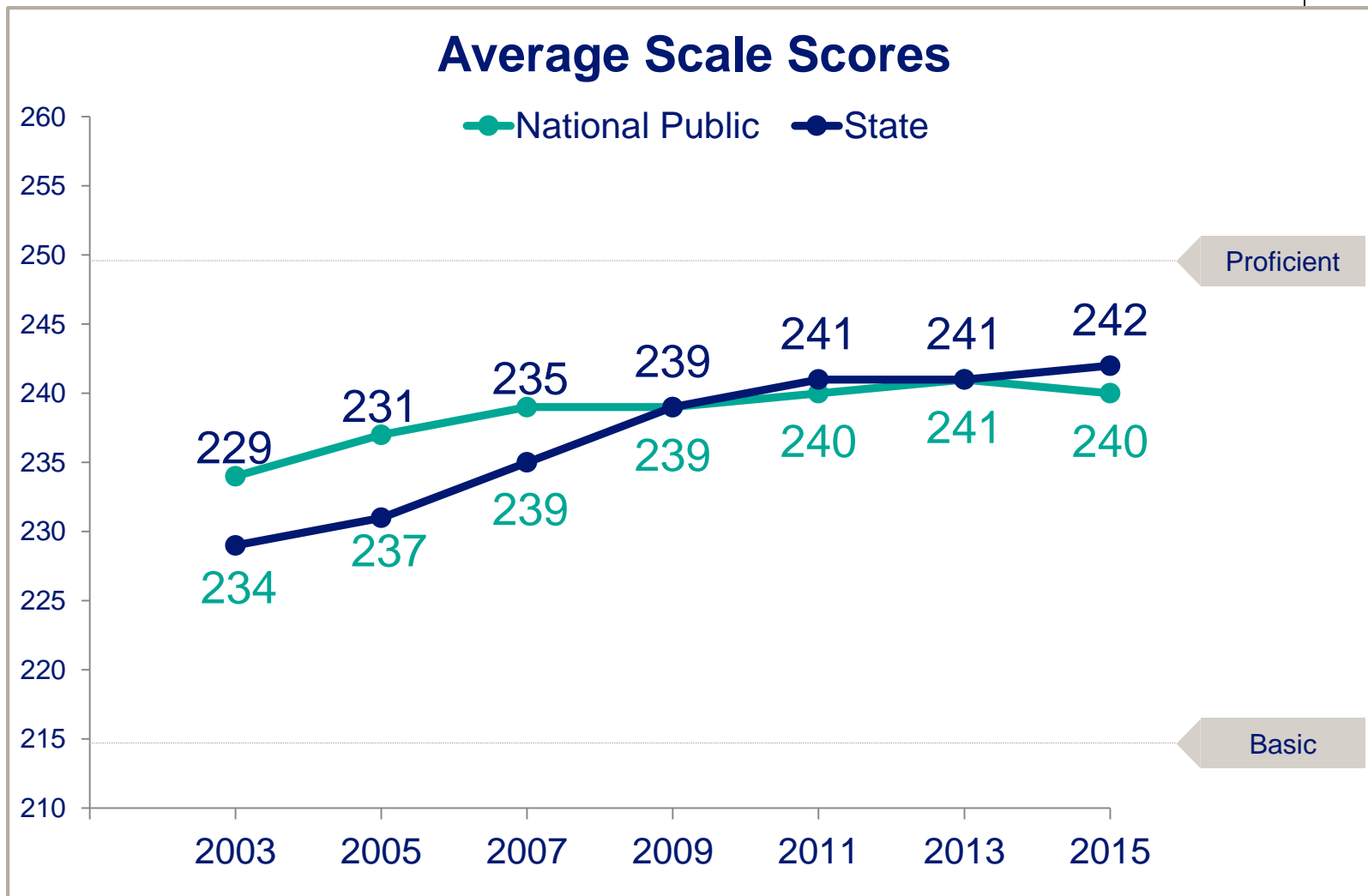
Not significantly different from Kentucky (nation and 22 jurisdictions)



Lower average scale score than Kentucky (20 jurisdictions)

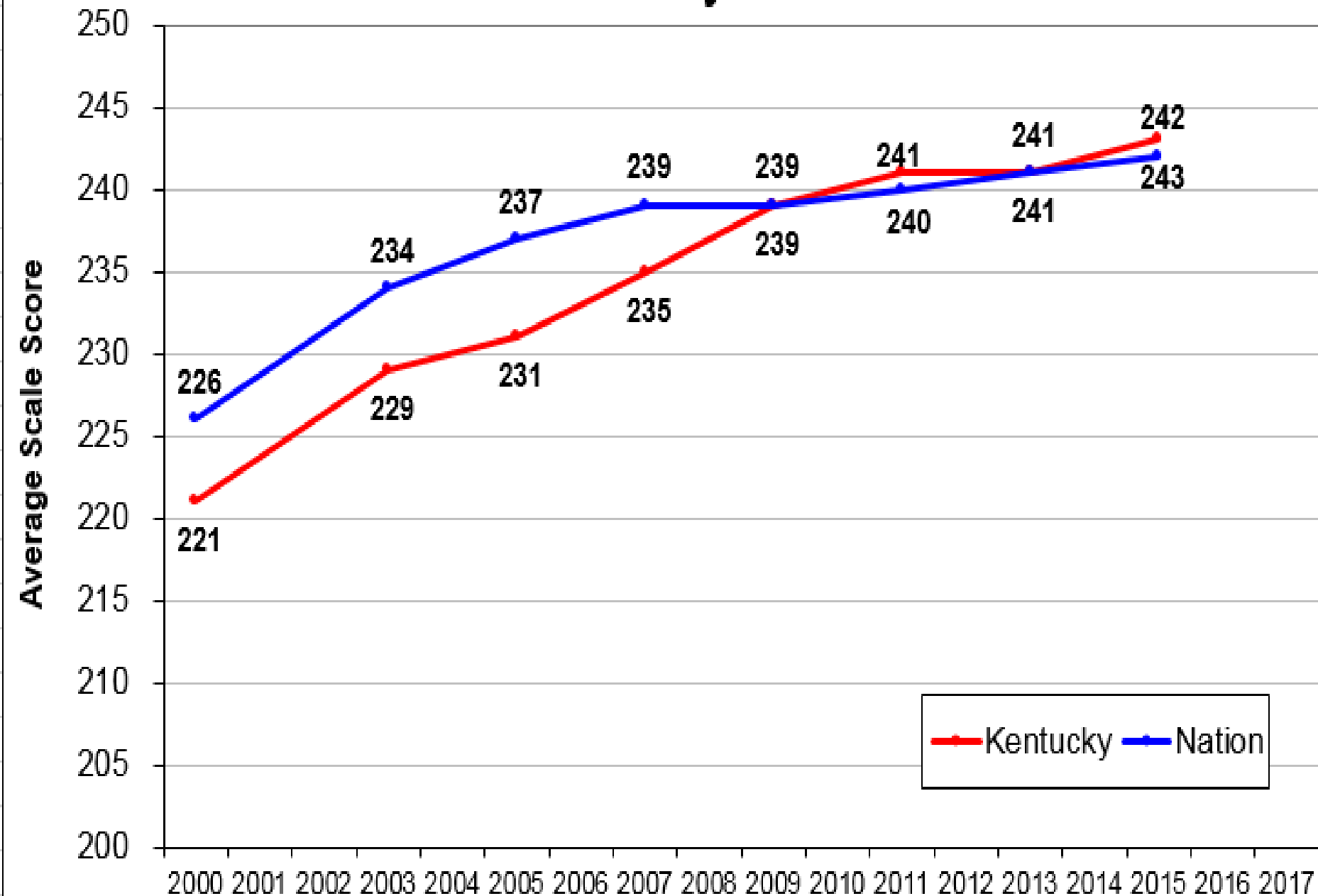


# Grade 4 Mathematics



NOTE: Observed differences are not necessarily statistically significant.

## Math 4th Grade Kentucky vs Nation 2000-2015



# Math Grade 4

	Kentucky – 4 <sup>th</sup> Grade Scale Score Average	Nation – 4 <sup>th</sup> Grade Scale Score Average
<b>2000</b>	<b>221</b>	<b>226</b>
<b>2003</b>	<b>229</b>	<b>234</b>
<b>2005</b>	<b>231</b>	<b>237</b>
<b>2007</b>	<b>235</b>	<b>239</b>
<b>2009</b>	<b>239</b>	<b>239</b>
<b>2011</b>	<b>241</b>	<b>240</b>
<b>2013</b>	<b>241</b>	<b>241</b>
<b>2015</b>	<b>242</b>	<b>240</b>

# Math KY and KY TUDA Grade 4

	Kentucky 4 <sup>th</sup> Grade Average Scale Scores	Nation 4 <sup>th</sup> Grade Average Scale Scores	KY TUDA Average (Jefferson County Public Schools)	TUDA Average (Large Cities)
2000	221	226		
2003	229	234		
2005	231	237		
2007	235	239		
2009	239	239	233	231
2011	241	240	235	233
2013	241	241	234	235
2015	242	240	236	234



# 2015 Math Grade 4 Scale Score

- In 2015, the average scale score for students in Kentucky was 242. This was not significantly different from the average score of 240 for public school students in the nation.
- In Kentucky, the average scale score for students in 2015 was not significantly different from the average score in 2013 (241) and was higher than the average score in 2000 (219).

# 2015 **MATH** Grade 4 Compared w/ Other Jurisdictions

Average scale score in KY was:

- Higher than 20 Jurisdictions
- Not significantly different from 22 Jurisdictions and
- Lower than 9 Jurisdictions

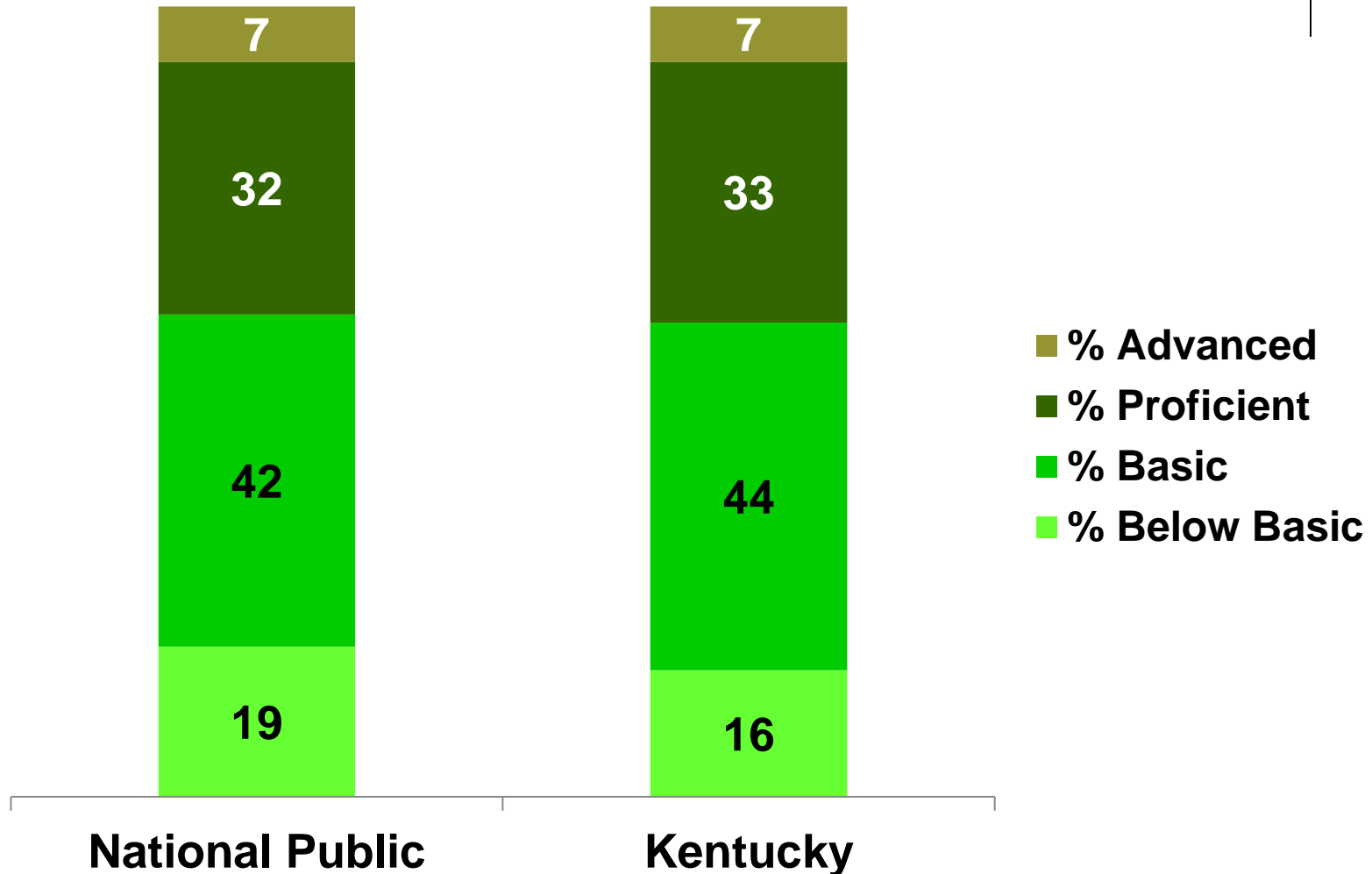
# KY 2015 Math Grade 4 Achievement Levels



The percentage of Kentucky's students who performed **at or above Proficient** was 40 percent.

- This percentage was not significantly different from that in 2013 (41%) and was greater than that in 2000 (17%).
- This was greater than the percentages in 13 jurisdictions, not significantly different from 29 jurisdictions and smaller than those in 9 jurisdictions.
- This was greater than the percentages in 1992, 1996, 2000, 2003, 2005, 2007 but was not significantly different from the percentage in 2009, 2011 and 2013.

# 2015 Math Grade 4 Achievement Levels




NOTE: Observed differences are not necessarily statistically significant. Percentages might not sum to 100 due to rounding.

# 2007 – 2015 Math Grade 4 Exclusion Rates\* of SD and/or ELL



Kentucky's Exclusion Rate						Nation's Exclusion Rate				
	'07	'09	'11	'13	'15	'07	'09	'11	'13	'15
%	3	3	3	1	2	3	2	2	2	2
In 2015, <b>25</b> states and jurisdictions had lower rates of exclusion than Kentucky's rate.										
In 2015, <b>2</b> states had higher rates										
In 2015, <b>24</b> states had equal rate										

\* Rates are rounded to nearest percentage

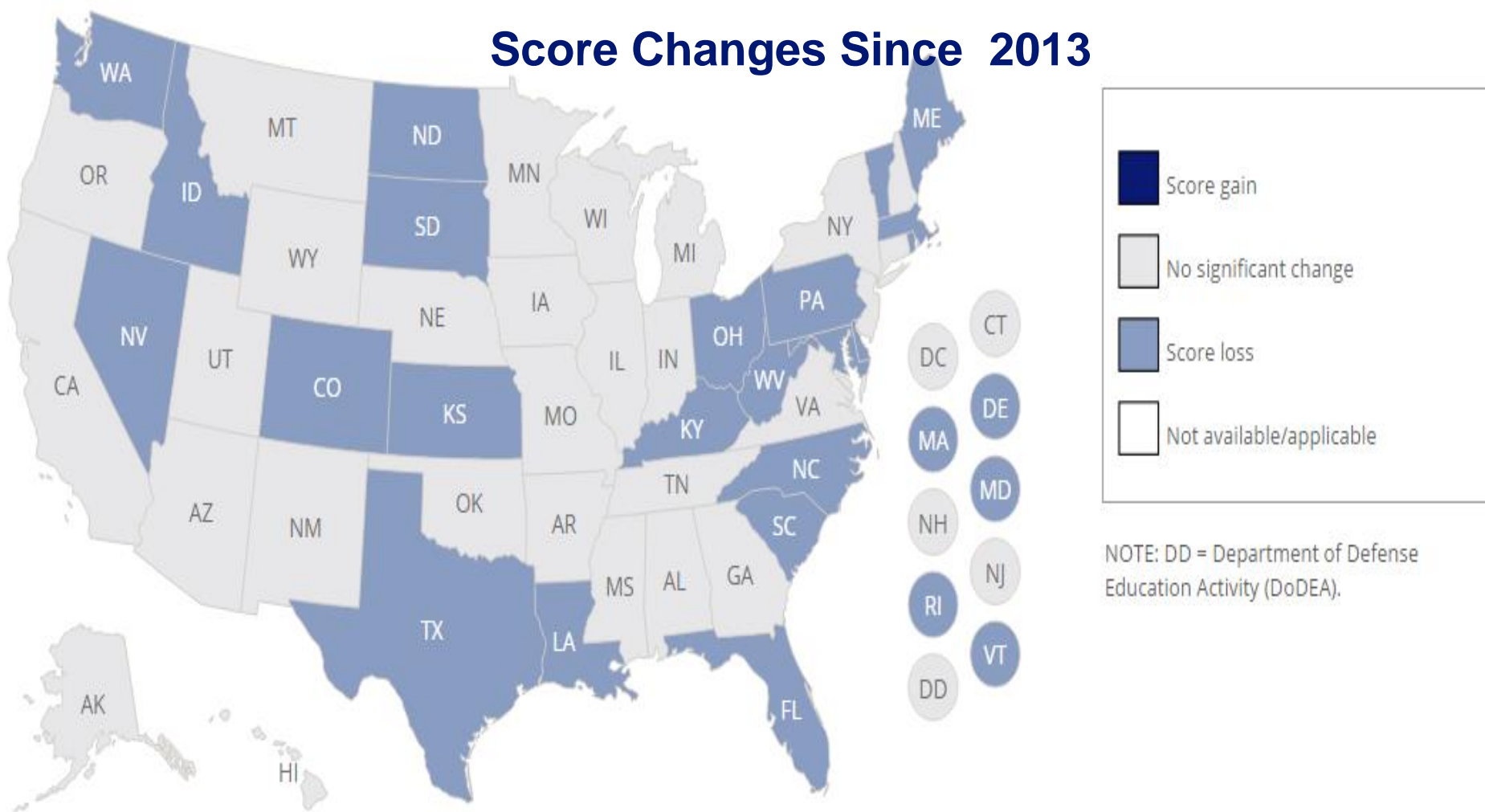


# Grade 8 Mathematics Results



# Grade 8 Mathematics

## Score Changes Since 2013

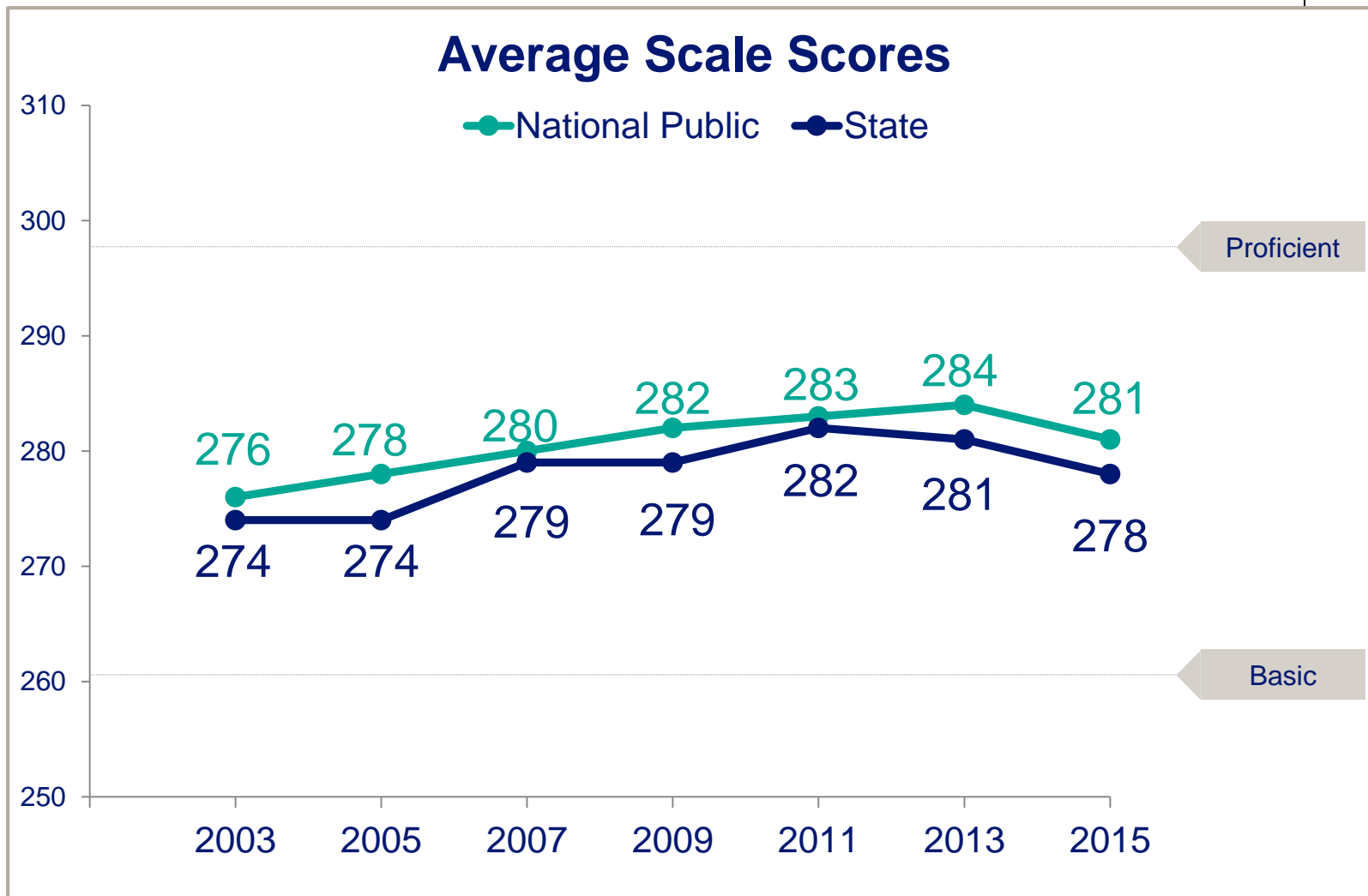






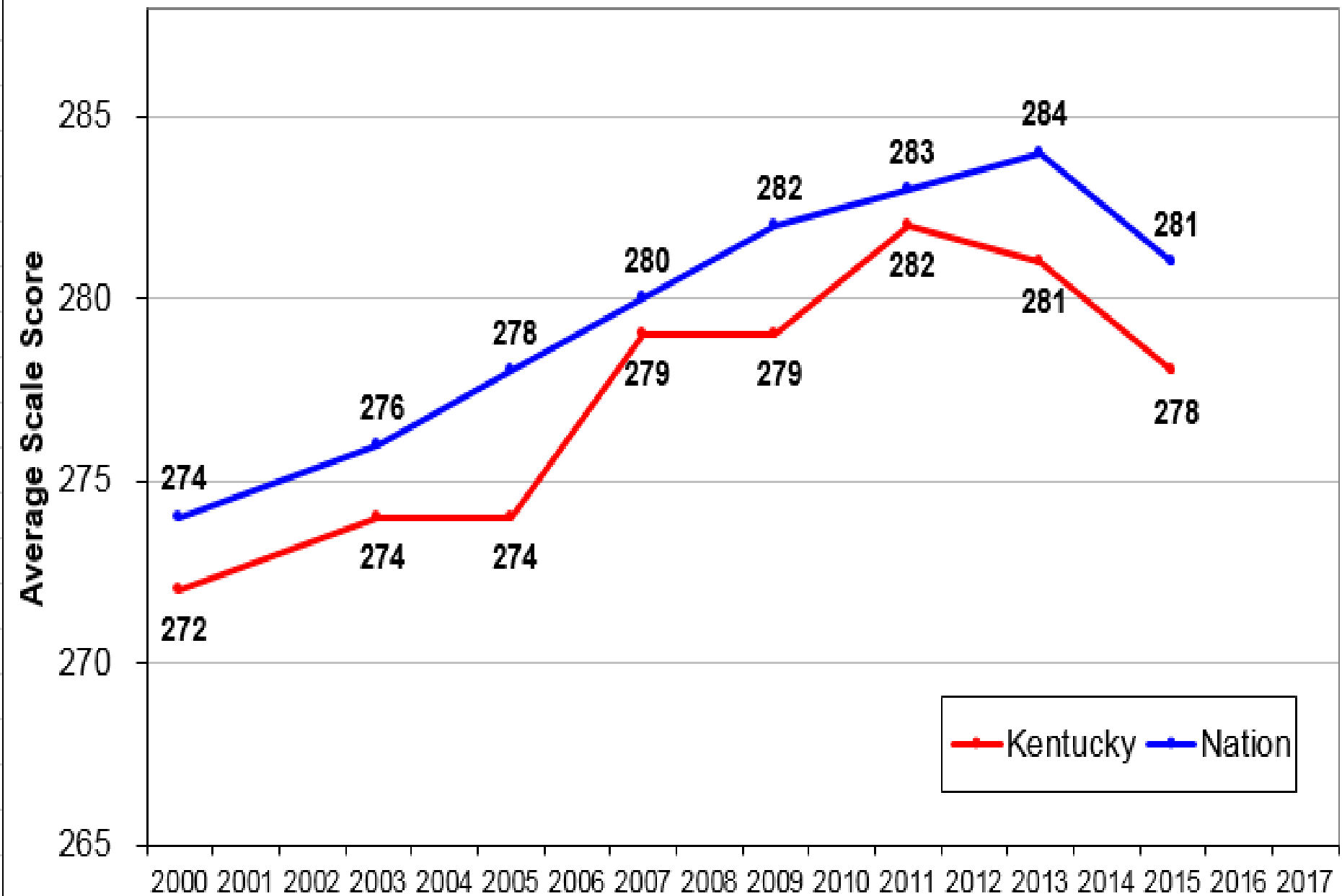


# Grade 8 Mathematics



NOTE: Observed differences are not necessarily statistically significant.

# Math 8th Grade Kentucky vs Nation 2000-2015



# 2000 to 2013 **Math** Grade 8

	<b>Kentucky – 8<sup>th</sup> Grade Scale Score Average</b>	<b>Nation – 8<sup>th</sup> Grade Scale Score Average</b>
<b>2000</b>	<b>270</b>	<b>272</b>
<b>2003</b>	<b>274</b>	<b>276</b>
<b>2005</b>	<b>274</b>	<b>278</b>
<b>2007</b>	<b>279</b>	<b>280</b>
<b>2009</b>	<b>279</b>	<b>282</b>
<b>2011</b>	<b>282</b>	<b>283</b>
<b>2013</b>	<b>281</b>	<b>284</b>
<b>2015</b>	<b>278</b>	<b>281</b>

# KY Average Scale Scores: Grade 8 Math 2000 - 2015



	Kentucky 8 <sup>th</sup> Grade Average Scale Scores	Nation 8 <sup>th</sup> Grade Scale Score Average	KY TUDA Average (Jefferson County Public Schools)	TUDA Average (Large Cities)
2000	270	272		
2003	274	276		
2005	274	278		
2007	279	280		
2009	279	282	271	271
2011	282	283	274	274
2013	281	284	273	276
2015	278	281	272	274

# 2015 Math Grade 8 Scale Score

- The average scale score for students in Kentucky was 278. This was lower than the average score of 281 for public school students across the nation.
- The average scale score for students in 2015 was lower than their average score in 2013 (281) and was higher than the average score in 2000 (270).

# 2015 **MATH** Grade 8 Compared w/ Other Jurisdictions

Average scale score in KY was:

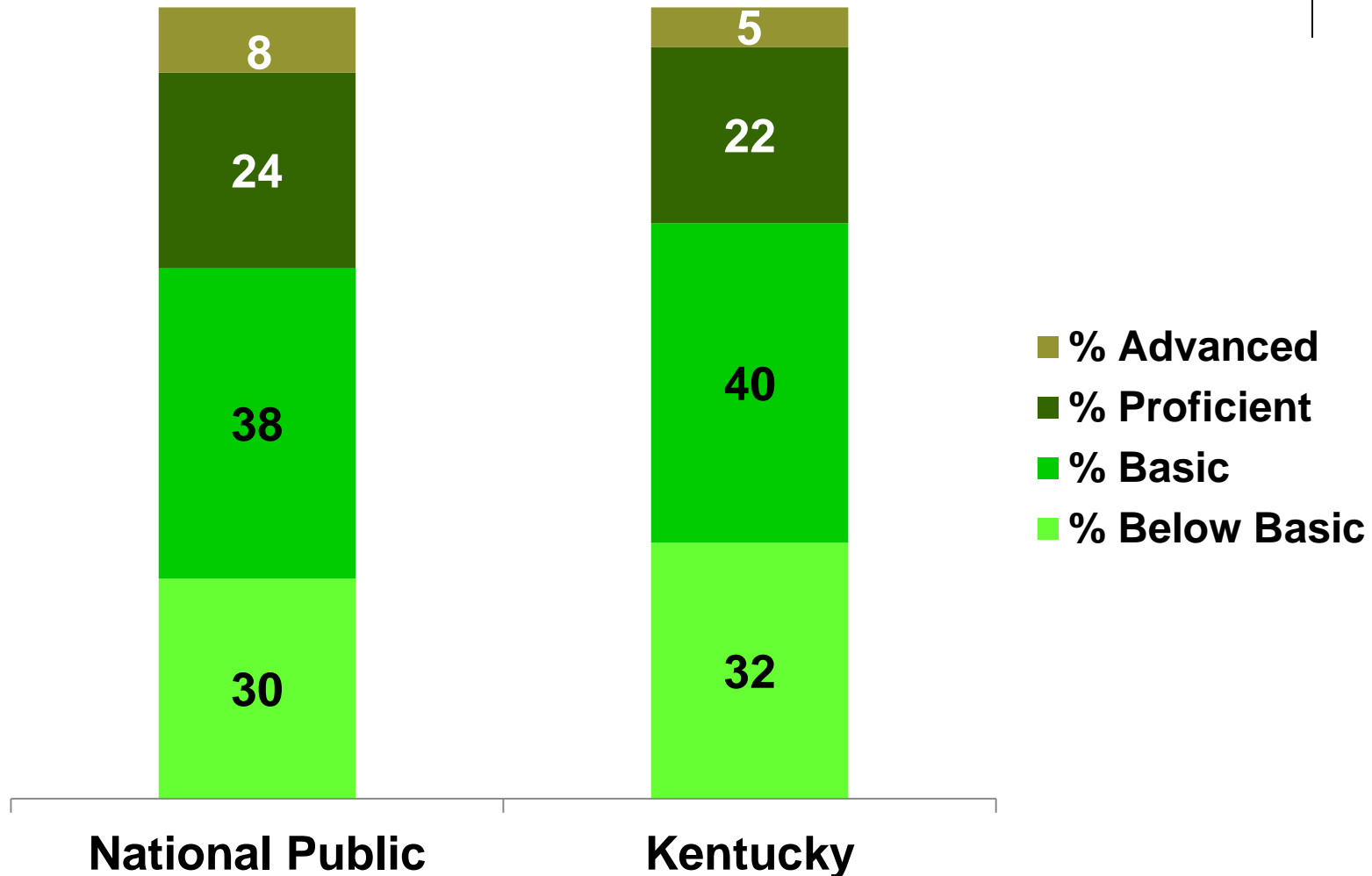
- Higher than 7 Jurisdictions
- Not significantly different from 14 Jurisdictions and
- Lower than 30 Jurisdictions

# 2015 Math Grade 8 Achievement Levels

The percentage of Kentucky's students who performed at or above Proficient was 28 percent.

- This percentage was not significantly different from that in 2013 (30%) and was greater than that in 2000 (20%).
- This was greater than the percentages in 7 jurisdictions, not significantly different from 12 jurisdictions and smaller than those in 32 jurisdictions.
- This was greater than the percentages in 1990, 1992, 1996, 2000, 2003 and 2005 but was not significantly different from the percentages in 2007, 2009, 2011 and 2013.

# 2015 Math Grade 8: Achievement Levels



NOTE: Observed differences are not necessarily statistically significant. Percentages might not sum to 100 due to rounding.



# 2015 Math Exclusion Rates\* of SD and/or ELL – Grade 8




Kentucky Exclusion Rate						Nation Exclusion Rate				
	'07	'09	'11	'13	'15	'07	'09	'11	'13	'15
%	7	5	3	2	1	4	3	3	2	2

In 2015, **no** states and jurisdictions had lower rates of exclusion than Kentucky's rate.

In 2015, **25** state had higher rates.

In 2015, 26 states had equal rate.

\* Rates are rounded to nearest percentage



# Summary of Mathematics Gap Results

# 2015 **Math** Scale Scores

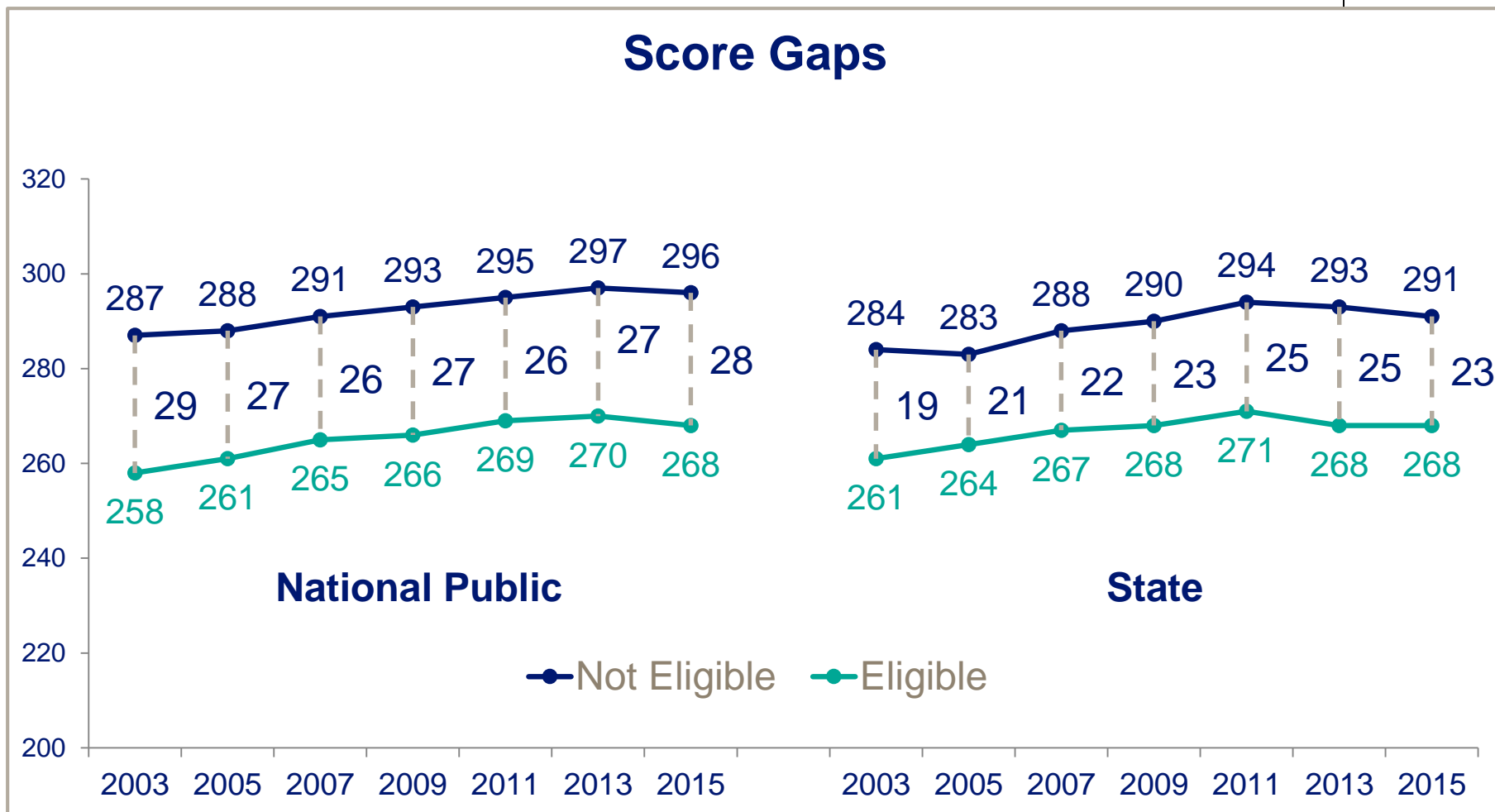
	Kentucky	Nation
4 <sup>th</sup> Grade Mathematics Scale Score	<b>242</b>	<b>240</b>
8 <sup>th</sup> Grade Mathematics Scale Score	<b>278</b>	<b>281</b>

# 2003-2015 Math Grade 4 Subgroup Trends

	Overall	White	Black	Hispanic	Free/ Reduced Lunch	Not Eligible F/RL	Students w Disabilities	Non- SD
2003	229	231	214	*	220	237	208	231
2005	231	234	217	*	224	240	215	234
2007	235	238	219	221	226	245	223	237
2009	239	241	220	227	229	249	226	241
2011	241	243	225	236	232	251	224	243
2013	241	244	224	234	232	251	218	245
2015	242	244	226	234	234	255	222	245



# Grade 4 Mathematics



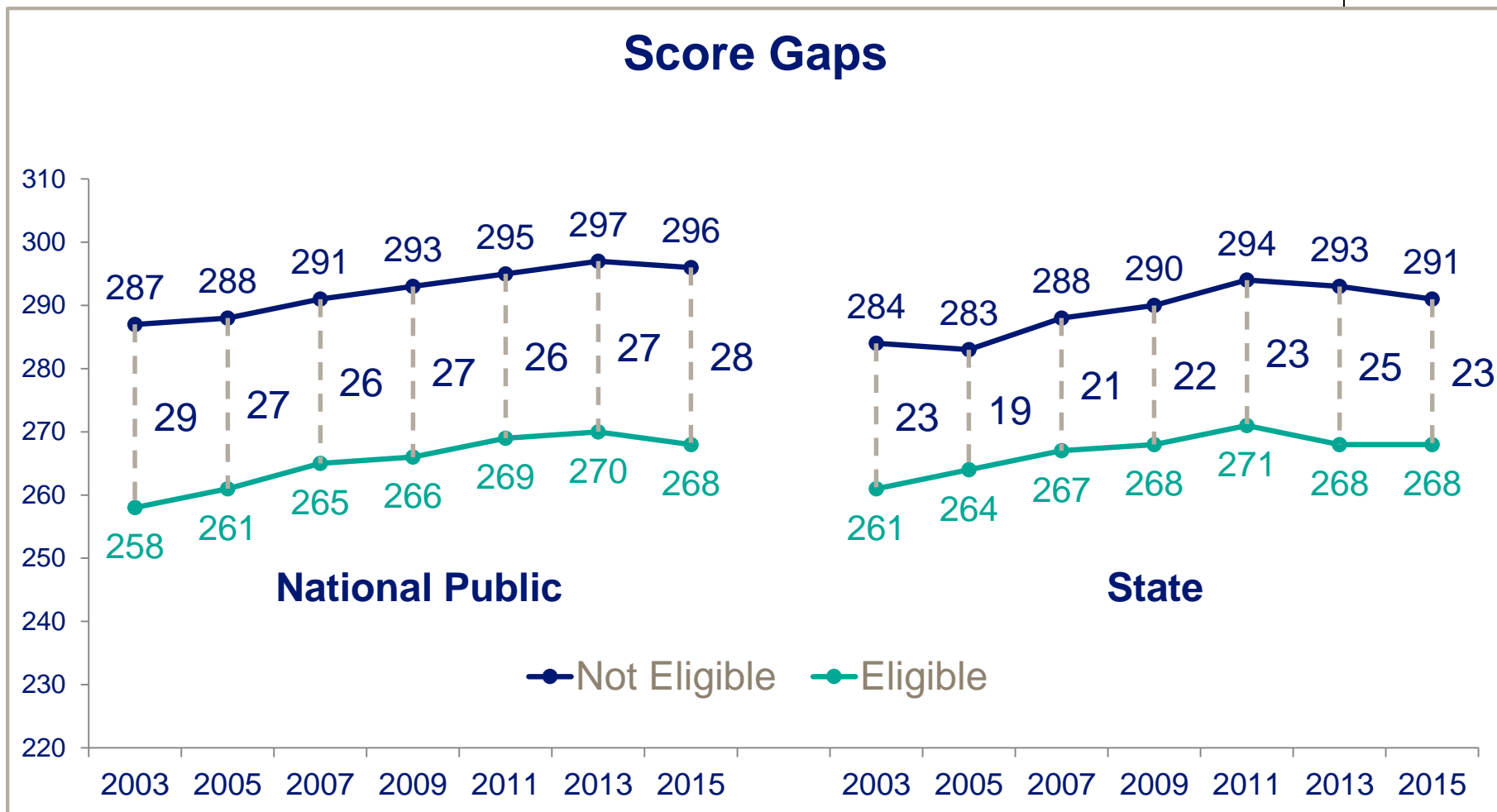
NOTE: Observed differences are not necessarily statistically significant. Score gaps are calculated based on differences between unrounded average scale scores.

# 2003-2015 Math Grade 8 Subgroup Trends

	Overall	White	Black	Hispanic	Free/ Reduced Lunch	Not Eligible F/RL	Students w Disabilities	Non- SD
2003	274	277	250	*	261	284	230	279
2005	274	276	255	*	264	283	243	277
2007	279	282	257	*	267	288	249	281
2009	279	282	258	272	268	290	250	282
2011	282	284	261	269	271	294	253	284
2013	281	283	260	269	268	293	246	284
2015	278	281	257	274	268	291	247	282



# Grade 8 Mathematics



NOTE: Observed differences are not necessarily statistically significant. Score gaps are calculated based on differences between unrounded average scale scores.

# Math by Free/Reduced Lunch

## Grades 4 and 8 – 2000 to 2015

	4 <sup>th</sup> Grade Eligible - KY (Nation)	4 <sup>th</sup> Grade Not Eligible - KY (Nation)	8 <sup>th</sup> Grade Eligible – KY (Nation)	8 <sup>th</sup> Grade Not Eligible - KY (Nation)
<b>2000</b>	207 (208)	230 (235)	255 (253)	280 (283)
<b>2003</b>	220 (222)	237 (244)	261 (258)	284 (287)
<b>2005</b>	224 (225)	240 (248)	264 (261)	283 (288)
<b>2007</b>	226 (227)	245 (249)	267 (265)	288 (291)
<b>2009</b>	229 (228)	249 (250)	268 (266)	290 (293)
<b>2011</b>	232 (229)	251 (252)	271 (269)	294 (295)
<b>2013</b>	232 (230)	251 (254)	268 (270)	293 (297)
<b>2015</b>	234 (229)	255 (253)	268 (268)	291 (296)



# Math Grades 4 and 8 (2000 – 2015)

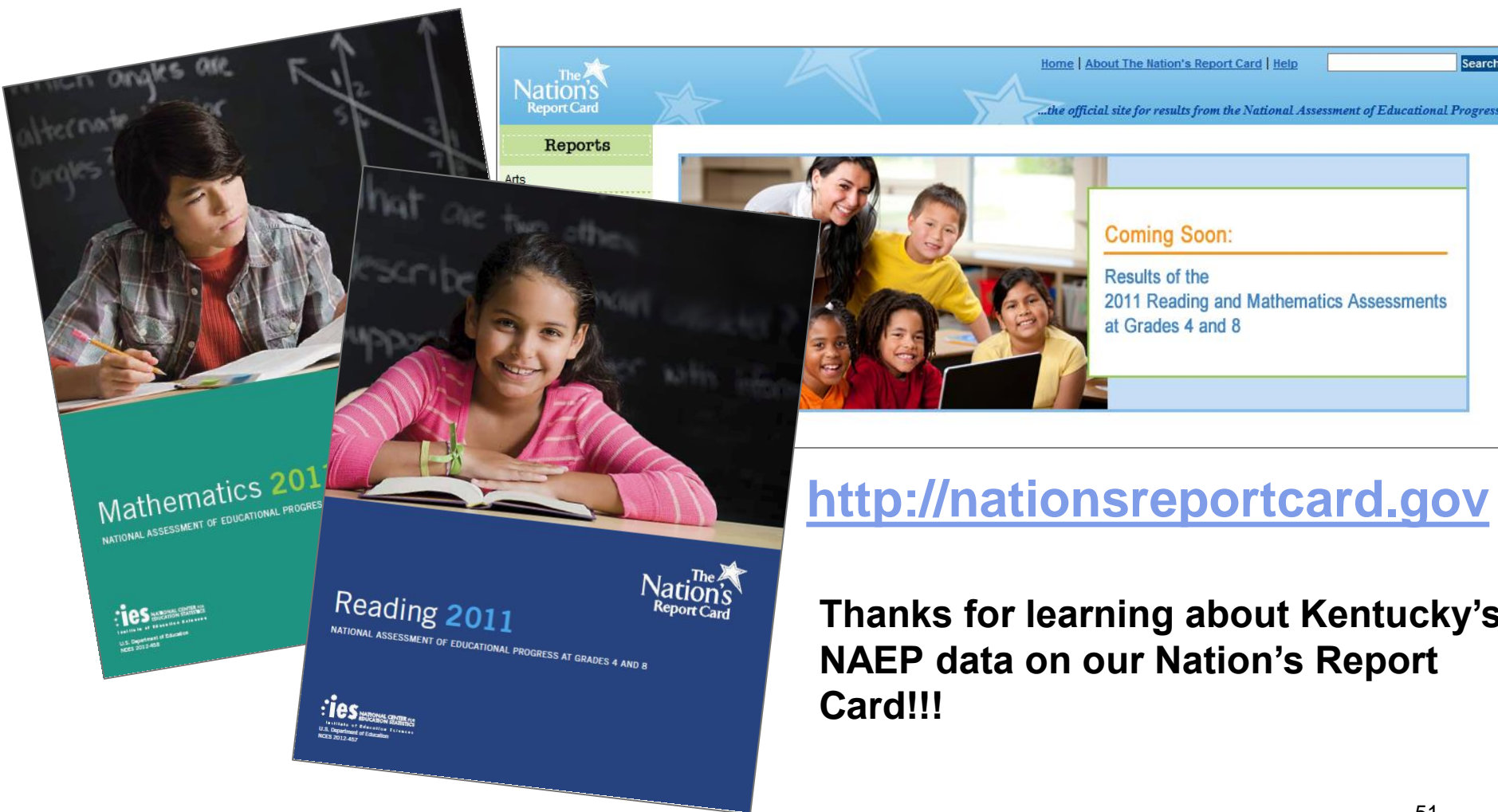
	4 <sup>th</sup> Grade White KY (Nation)	4 <sup>th</sup> Grade American - African KY (Nation)	8 <sup>th</sup> Grade White KY (Nation)	8 <sup>th</sup> Grade American - African KY (Nation)
2000	223 (233)	196 (203)	272 (283)	250 (243)
2003	231 (243)	214 (216)	277 (287)	250 (252)
2005	234 (246)	217 (220)	276 (288)	255 (254)
2007	238 (248)	219 (222)	282 (290)	257 (259)
2009	241(248)	220 (222)	282 (292)	258 (260)
2011	243 (249)	225 (224)	284 (293)	261 (262)
2013	244 (250)	224 (224)	283 (293)	260 (263)
2015	244 (248)	226 (224)	281 (291)	257 (260)

# Math by Gender

## Grades 4 and 8 – 2000 to 2015

	4 <sup>th</sup> Grade Male KY (Nation)	4 <sup>th</sup> Grade Female KY (Nation)	8 <sup>th</sup> Grade Male KY (Nation)	8 <sup>th</sup> Grade Female KY (Nation)
<b>2000</b>	220 (225)	219 (223)	271 (273)	269 (271)
<b>2003</b>	230 (235)	227 (233)	275 (277)	274 (275)
<b>2005</b>	233 (238)	230 (236)	275 (278)	273 (277)
<b>2007</b>	237 (240)	234 (238)	280 (281)	277 (279)
<b>2009</b>	240 (240)	238 (238)	281 (283)	278 (281)
<b>2011</b>	242 (241)	240 (239)	282 (283)	281 (282)
<b>2015</b>	242 (242)	241 (241)	281 (284)	280 (283)

## For more information



The collage features three main items:

- Mathematics 2011** book cover: A green cover with a photo of a boy writing on a chalkboard. Text includes "Mathematics 2011", "NATIONAL ASSESSMENT OF EDUCATIONAL PROGRESS", and the IES logo.
- Reading 2011** book cover: A blue cover with a photo of a girl reading. Text includes "Reading 2011", "NATIONAL ASSESSMENT OF EDUCATIONAL PROGRESS AT GRADES 4 AND 8", and the IES logo.
- The Nation's Report Card** website screenshot: A blue header with the site name and navigation links (Home, About The Nation's Report Card, Help). A "Search" box is on the right. Below the header is a "Reports" section with a "Arts" link. A large photo of a teacher and students is shown. A "Coming Soon:" box announces "Results of the 2011 Reading and Mathematics Assessments at Grades 4 and 8".

<http://nationsreportcard.gov>

**Thanks for learning about Kentucky's  
NAEP data on our Nation's Report  
Card!!!**

# Explore the results on the new online report card



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